

TYPE MATERIAL OF TWO AFRICAN SPECIES OF
HERPETOGRAMMA AND ONE OF *PLEUROPTYA*
(LEPIDOPTERA: CRAMBIDAE: PYRAUSTINAE)

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Abstract. — Lectotypes for the African pyraustine species *Botys mutualis* Zeller and *Botys aegrotalis* Zeller (Lepidoptera: Crambidae: Pyraustinae) are designated, illustrated, and characterized, and the species transferred to *Herpetogramma* and *Pleuroptya*, respectively (new combinations). The holotype of the related *Botys verminalis* Guenée is also illustrated, and characterized, and the species transferred to *Herpetogramma* (new combination). The 3 species are considered distinct from one another and from the American *Herpetogramma bipunctalis* (Fabricius) with which they were synonymized by Hampson, 1899.

Key Words: African Pyraustinae, Pyralidae, lectotypes, Zeller types, *Herpetogramma bipunctalis*, *Herpetogramma mutualis*, *Herpetogramma verminalis*, *Pleuroptya aegrotalis*

This paper grew out of an attempt to identify two sibling species of the pyraustine genus *Herpetogramma* for a faunal study on the Crambidae of Aldabra Atoll (in prep.). We had narrowed our search to three externally similar African species: *Botys aegrotalis* Zeller, *B. mutualis* Zeller, and *B. verminalis* Guenée. All three appeared to be very close to the two Aldabra species, and in fact were among 18 names synonymized by Hampson (1899: 204) under *Pachyzancla bipunctalis* (Fabricius), a pest species commonly known as the southern beet webworm. While it is beyond the scope of this paper to review that synonymy, most of those 18 are deserving of separate specific status, with *bipunctalis* itself being restricted to the Western Hemisphere. Our purposes here are to illustrate types in order to facilitate identification, to provide proper generic assignment, and to designate lectotypes so as to promote stability for the names.

We follow Minet's (1981) separation of the traditional family Pyralidae into Crambidae and Pyralidae, this essentially along the same lines as the division of the Pyralidae into the Series Crambiformes and Pyraliformes in the Moths of North America (MONA) volumes (Munroe *in* Dominick 1972).

Through the courtesy of Mr. Bert Gustafsson of the Swedish Natural History Museum [NHRM] we were able to borrow for dissection two specimens placed under *aegrotalis*, there being no material found there under *mutualis*. Each specimen bore a "Caf-fraria" label (Fig. 4) typical of the material Zeller (1852) examined in his study, and so could be a type. There is also Zeller material labeled as *aegrotalis* and *mutualis* in the collection of the British Museum (Natural History) [BMNH].

After a more detailed examination of the two Stockholm specimens it became clear that they were not conspecific and that nei-



Figs. 1-3. Adult moths. 1, *Herpetogramma mutialis*, lectotype; 2, *H. verminalis*, holotype; 3, *Pleuroptya aegrotalis*, lectotype. Scale bar = 2 mm.



Figs. 4–6. Specimen labels. 4, *Herpetogramma mutualis*, lectotype (1.0×); 5, *H. vermalis*, holotype (1.6×); 6, *Pleuroptya aegrotalis*, lectotype (1.6×).

ther matched Zeller's description of *aegrotalis*. However, one of these (Figs. 1, 4) was a better match for *mutualis* than the specimen under that name in the British Museum, and so we designate this Stockholm specimen as the lectotype. The other Stockholm specimen (J. C. Shaffer ♂ genitalia slide no. 1944) is conspecific with an Aldabran species which we intend to describe as new.

Herpetogramma mutualis (Zeller),
NEW COMBINATION, Revised Status

Figs. 1, 4, 7–10

Botys mutualis Zeller, 1852: 40–41.

Pachyzancla mutualis (Zeller). Hampson, 1899: 204. As synonym of *P. bipunctalis* (Fabricius).

Lectotype, hereby designated, labeled (Fig. 4): "Caffraria"; "Riksmuseum Stockholm"; "♂ genitalia on slide 1943 J. C. Shaffer"; "Lectotype *Botys mutualis* by J. Shaffer & E. Munroe, 1989." [NHRM]. Zeller indicated that he had both sexes represented, but did not specify the number of specimens. As we have not discovered any other specimens conspecific with the lectotype in material known to have been studied by Zeller, we conclude that either his type series was of mixed composition or some of it has been lost.

Type locality: South Africa. Zeller (p. 41) cites the type locality as: "Habitat in tractibus fluviorum Limpoponis et Gariepis." This is roughly the region of the Transvaal

and Orange Free State. (See Shaffer & Munroe, 1989: 272.)

The following points of agreement between Zeller's description and the lectotype (Fig. 1) are particularly noteworthy (italics text adapted rather freely from Zeller's description). Comparisons of the same characters are made with the BMNH specimen under *mutualis*, and with the BMNH lectotype (designated below) of *aegrotalis* (Fig. 3). The purpose of the comparisons with the BMNH specimens is to demonstrate clearly that neither of them matches Zeller's description of *mutualis*.

a. *Wing lines nodulose*—This is clearly seen in the postmedial line of the *mutualis* lectotype. In the BMNH specimen under *mutualis* the postmedial line is interrupted, but not nodular, and in the *aegrotalis* lectotype it is continuous and clearly not nodular.

b. *Posterior sinus* (outward bulge) of *postmedial line less rectilinear than in aegrotalis*—The upper and lower outer angles of this bulge form right angles in the *aegrotalis* lectotype and approximate this in the BMNH specimen under *mutualis*, but are rounded in the lectotype of *mutualis*.

c. *Small spot or thickened dot on transverse vein*—This is a reference to the discal spot, elliptical in both the *mutualis* lectotype and the BMNH specimen under *mutualis*, but conspicuously different in *aegrotalis* with its lunate discal spot. This is one of the most obvious features separating *mutualis* and *aegrotalis*.

d. *Orbicular spot halfway between antemedial line and discal spot*—This feature fits the lectotype, but in the BMNH specimen under *mutualis* and in *aegrotalis* the orbicular spot is at approximately $\frac{2}{5}$ the distance from the antemedial line to the discal spot.

e. *Postmedial line thickened at costa*—This feature is evident in the *mutualis* lectotype, but not in the BMNH specimen under *mutualis* where the line stops short of the costa, nor in the *aegrotalis* lectotype where the line reaches the costa but is not thickened there.

f. *Postmedial line nearly straight above sinus*—The *mutualis* lectotype and the BMNH specimen under *mutualis* agree in this feature, but in the *aegrotalis* lectotype this portion of the line is concave.

g. *Hindwing discal spot round*—The *mutualis* lectotype and the BMNH specimen under *mutualis* agree in this, but in the *aegrotalis* lectotype the discal spot is in the form of a short bar.

h. *Hindwing with outward sinus of postmedial line straight*—The *mutualis* lectotype agrees with this and the BMNH specimen under *mutualis* is very close, but in *aegrotalis* the upper side is curved.

In the male genitalia of the lectotype (Figs. 7–10) the uncus is narrowly triangular with the sides less divergent on the distal third and the apex narrowly rounded; the distal third is moderately setose with the setae extending toward the base along the sides, but not quite reaching the base. The inner margin of the sacculus bears a small, low, moundlike setose projection (Fig. 8) on its inner margin, but no clasper is present. Two kinds of armature occur on the vesica; just posterior to the center of the aedeagus is seen an irregular platelike sclerite presenting a short digitate profile, ill defined anteriorly, rounded posteriorly, tapering, acute at its apex. This feature did not photograph well, but is outlined in black ink in Fig. 9. On the distal fourth of the aedeagus the unevverted vesica exhibits a 'bottle-brush' arrangement (Fig. 10) of what appears to be a very large number of slender apparently

spatulate setae densely arranged around a central axis.

Herpetogramma verminalis (Guenée),
NEW COMBINATION, Revised Status

Figs. 2, 5, 14–16

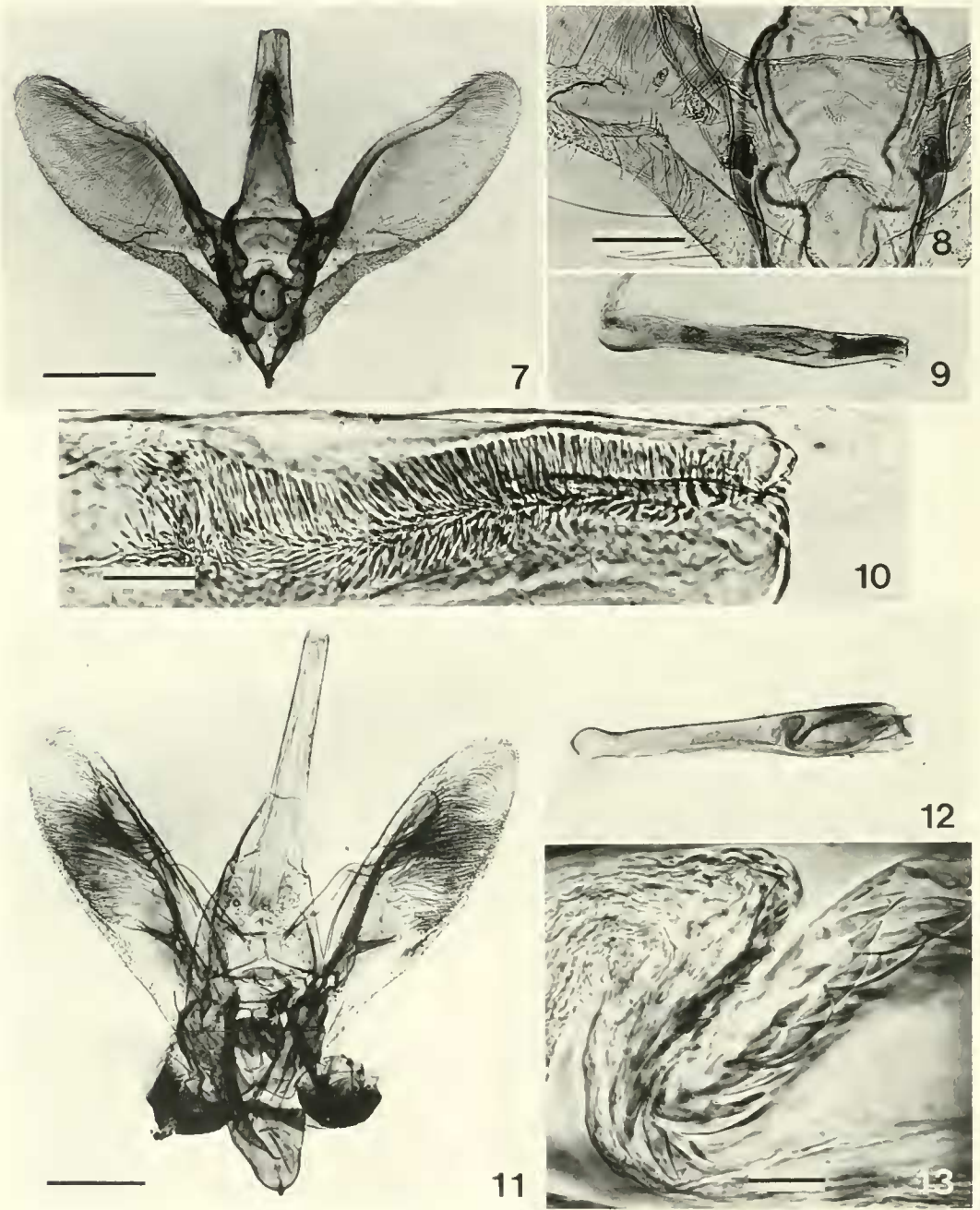
Botys verminalis Guenée, 1854: 348.

Pachyzancla verminalis (Guenée). Hampson, 1899: 204. As synonym of *P. bipunctalis* (Fabricius).

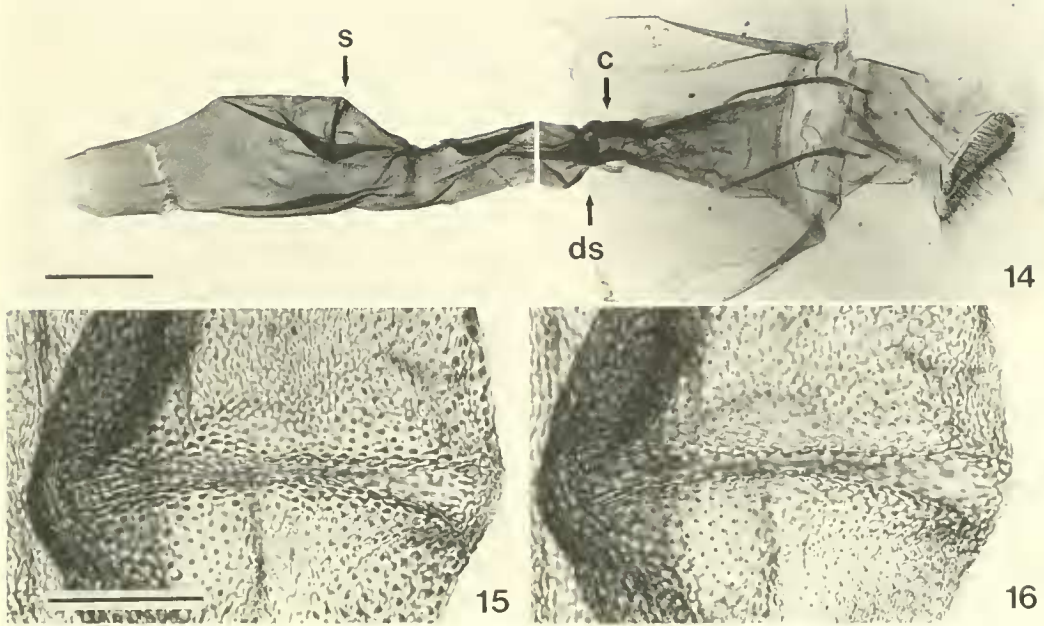
Holotype, female, Sierra Leone, labelled: "Holo-type"; "Verminalis Gn. Sierra Leone"; "Paravicini Coll. B.M. 1937-383."; "Holotype"; "♀ Pyralidae Brit. Mus. Slide No. 14576" [BMNH].

We illustrate the holotype (Fig. 2) to show the wing pattern, which is different from both those of *mutualis* and *aegrotalis*, and we figure the genitalia, although Michael Shaffer reports that the abdomen appeared to have been glued on, so that there is some doubt as to its correct association. Nonetheless, the wing maculation is clearly that of a *Herpetogramma*, and characters of the genitalia agree well with those of known species of *Herpetogramma*. Further study of the genus may well show that the genitalia figured are indeed those of *verminalis*.

Female genitalia (Figs. 14–16).—Posterior apophysis straight, slender; anterior apophysis about 2× as long as posterior, broadened and distinctly downcurved near base. Anterior half of eighth-segment collar nude, posterior half bearing numerous fine setae (on this specimen about 36 on right side, about 28 on left side, about 16 ventrally). Ostial chamber funnel shaped; anterior half with numerous folds bearing minute subovate scales, each several micrometers wide (these best seen on edge, and then with difficulty). Ductus bursae broadly joining corpus bursae; posterior end forming smooth, unarmed, well sclerotized collar (Fig. 14, c) nearly 2× as wide as long; anterior and adjacent to this collar the membrane armed with numerous minute sharp spines, these continued anteriorly,



Figs. 7-13. Male genitalia. 7, *Herpetogramma mutualis*, lectotype; 8, enlarged to show basal detail of left valve; 9, aedeagus; 10, distal end of aedeagus, enlarged. 11, *Pleuroptya aegrotalis*, lectotype; 12, aedeagus; 13, detail of vesica showing cornuti. Scale bar = 0.50 mm (Figs. 7 & 9, 11 & 12); 0.20 mm (Fig. 8); 0.05 mm (Figs. 10, 13).



Figs. 14–16. *Herpetogramma verminalis*, holotype. Fig. 14, female genitalia (c = sclerotized collar of ductus bursae, ds = ductus seminalis, s = signum); Figs. 15–16, signum, enlarged, two focal levels, each rotated 90° clockwise relative to Fig. 14. Scale bar = 0.50 mm (Fig. 14), 0.10 mm (Figs. 15–16).

gradually becoming shorter, broader, and forming triangular denticles which extend onto corpus bursae to a short distance beyond signum (many are seen in Figs 15, 16). Corpus bursae with midregion bearing weakly developed transverse signum about half as long as corpus bursae width (Fig. 14, s); at high magnification (Figs. 15, 16) signum seen as a deep narrow groove armed with minute triangular denticles on its margin and sides, and with longer spatulate scales at its bottom and ends. Ductus seminalis (Fig. 14, ds) from ductus bursae just anterior to sclerotized collar; broadened and funnel shaped at origin.

***Pleuroptya aegrotalis* (Zeller),
NEW COMBINATION, Revised Status**
Figs. 3, 6, 11–13

Botys aegrotalis Zeller, 1852: 38–39.

Pachyzancla aegrotalis (Zeller), Hampson, 1899: 204. As synonym of *P. bipunctalis* (Fabricius).

Psara aegrotalis (Zeller). Klima, 1939: 384.
As distinct species.

Lectotype, hereby designated, labeled (Fig. 5): “Type”; “*Botys aegrotalis* Z. Caffr. 39. Led. 85. Caffraria.” [handwritten]; “Zell. Coll. 1884.”; “♂ Pyralidae Brit. Mus. Slide No. 17755”; “Lectotype by J. Shaffer & E. Munroe, 1989.” The original description was based on the male sex. The number of specimens was unspecified and we have not discovered additional Zeller material of this species.

Type locality: South Africa. Zeller (p. 39) cites the type locality as: “Habitat in tractibus fluviorum Limpoponis et Gariëpis.” This is roughly the region of the Transvaal and Orange Free State. (See Shaffer & Munroe, 1989: 272.)

As discussed above neither of the males under *aegrotalis* in the Stockholm museum matches the original description. We have chosen the single male in the British Mu-

seum as the lectotype as it is a good match for Zeller's description, the following points of agreement being particularly noteworthy (Fig 3):

- a. The forewing apex is acuminate.
- b. The forewing termen (outer margin) is oblique and slightly convex posteriorly.
- c. The discocellular spot is a distinct lunule. This is one of the most obvious features of *aegrotalis*.
- d. The outward sinus of the postmedial line forms nearly a right angle at both top and bottom ends.
- e. The hindwing discocellular is marked by a short bar rather than by a spot.

We also note that in contrast to *mutualis* the postmedial line is not thickened at the apex and is not nodular.

The male genitalia of the lectotype (Figs. 11–13) show that, despite its resemblance in wing pattern to certain species of *Herpetogramma*, *aegrotalis* does not belong to that genus at all, but is a typical member of the genus *Pleuroptya* Meyrick, 1890, where we transfer it as a new combination (see above). Among the distinctive features are the short, distally truncate and medially slightly excavated uncus, without specialized dorsal scaling or spines, the narrow, bridgelike gnathos, the broad, medially complete transtilla, the prominent saccus, the large saclike coremata, and the ventrodistally oblique, clavate clasper, arising subbasally from the subcostal ridge of the valve. The vesica, withdrawn in the holotype within the clavate aedeagus, is densely set with small but strong, triangular denticles (Fig. 13).

Several probably related species occur in

Africa, but we have not so far detected any junior synonym that needs to be supplanted by *aegrotalis*.

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LITERATURE CITED

- Guenée, A. 1854. Deltoides et Pyralites. In J.B.A.D. Boisduval and A. Guenée, Histoire naturelle des insects: Species général des Lépidoptères, 8: 448 pages, 10 plates. Paris: Librairie Encyclopedique de Roret.
- Hampson, G. F. 1899. A Revision of the Subfamily Pyraustinae of the Family Pyralidae, Part II. Proc. Zool. Soc. Lond. 1899: 172–291, figs. 86–161, plates 16–19.
- Klima, A. 1939. Pyralidae: Subfamily Pyraustinae II. In F. Bryk, ed., Lepidopterorum Catalogus 89: 225–384. 's-Gravenhage: W. Junk.
- Minet, Joel. 1981. Les Pyraloidea et leurs principales divisions systematiques. Bull. Soc. Ent. Fr. 86: 262–280.
- Munroe, E. G. 1972. In Dominick, R. B., et al., The Moths of America North of Mexico, Fasc. 13.1A, Pyraloidea (in part). The Curwen Press, London.
- Shaffer, J. C. and E. G. Munroe. 1989. Type Material of Four African Species of *Notarcha* Meyrick, with Designations of Lectotypes and Changes in Synonymy (Lepidoptera: Crambidae: Pyraustinae) Proc. Entomol. Soc. Wash. 91(2): 265–273.
- Zeller, P. C. 1852. Lepidoptera Microptera. quae J. A. Wahlberg in Caffrorum Terra Collegit. Kongl. Vetenskaps-Akademiens Handlingar för År 1852, pages 1–120.